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DISTRIBUTION, BIOMASS, RECRUITMENT AND PRODUCTIVITY OF *ANADARA SENILIS* (L.) (MOLLUSCA: BIVALVIA) ON THE BANC D'ARGUIN, MAURITANIA.

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ABSTRACT

Data on distribution, ecology, biomass, recruitment, growth, mortality and productivity of the West African bloody cockle *Anadara senilis* were collected at the Banc d'Arguin, Mauritania, in early 1985 and 1986. Ash-free dry weight appeared to be correlated best with shell height. *A. senilis* was abundant on the tidal flats of landlocked coastal bays, but nearly absent on the tidal flats bordering the open sea. The average biomass for the entire area of tidal flats was estimated at 5.5 g·m^{-2} ash-free dry weight. The *A. senilis* population appeared to consist mainly of 10 to 20-year-old individuals, showing a very slow growth and a production : biomass ratio of about 0.02 y^{-1}. Recruitment appeared negligible and mortality was estimated to be about 10% per year. Oystercatchers (*Haematopus ostralegus*), the gastropod *Cymbium cymbium* and unknown fish species were responsible for a large share of this. The distinction of annual growth marks permitted the assessment of year-class strength, which appeared to be correlated with the average discharge of the river Senegal. This may be explained by assuming that year-class strength and river discharge both are correlated with rainfall at the Banc d'Arguin.

1. INTRODUCTION

The West African bloody cockle *Anadara senilis* (L.) (also known as *Arca senilis*) occurs from the former Rio de Oro in the north to Angola in the south (NICKLÈS, 1950). Little is known about its ecology. YONGE (1955) presents a short account of its habits. YOLOYE (1976) gives data on distribution and ecology of the species in Ghana and Nigeria. DJANGMAH *et al.* (1979) give some physiological data on tolerance of low salinities.

ALTENBURG *et al.* (1982) encountered the species in large numbers on the tidal flats of the Banc d'Arguin in Mauritania. In their samples from different localities on the Banc d'Arguin *A. senilis* had an average biomass of 4.7 g ash-free dry weight per m^2, thus accounting for about 60% of the total biomass of all macrobenthic animals living on the tidal flats.

Hence, we paid special attention to this species during a Dutch-Mauritanian research project on wintering waders and their benthic food resources on the Banc d'Arguin (Fig. 1) in 1985-86. In this paper we report on the distribution, ecology, biomass, recruitment, growth, mortality and productivity of *A. senilis* in 1985 and 1986.

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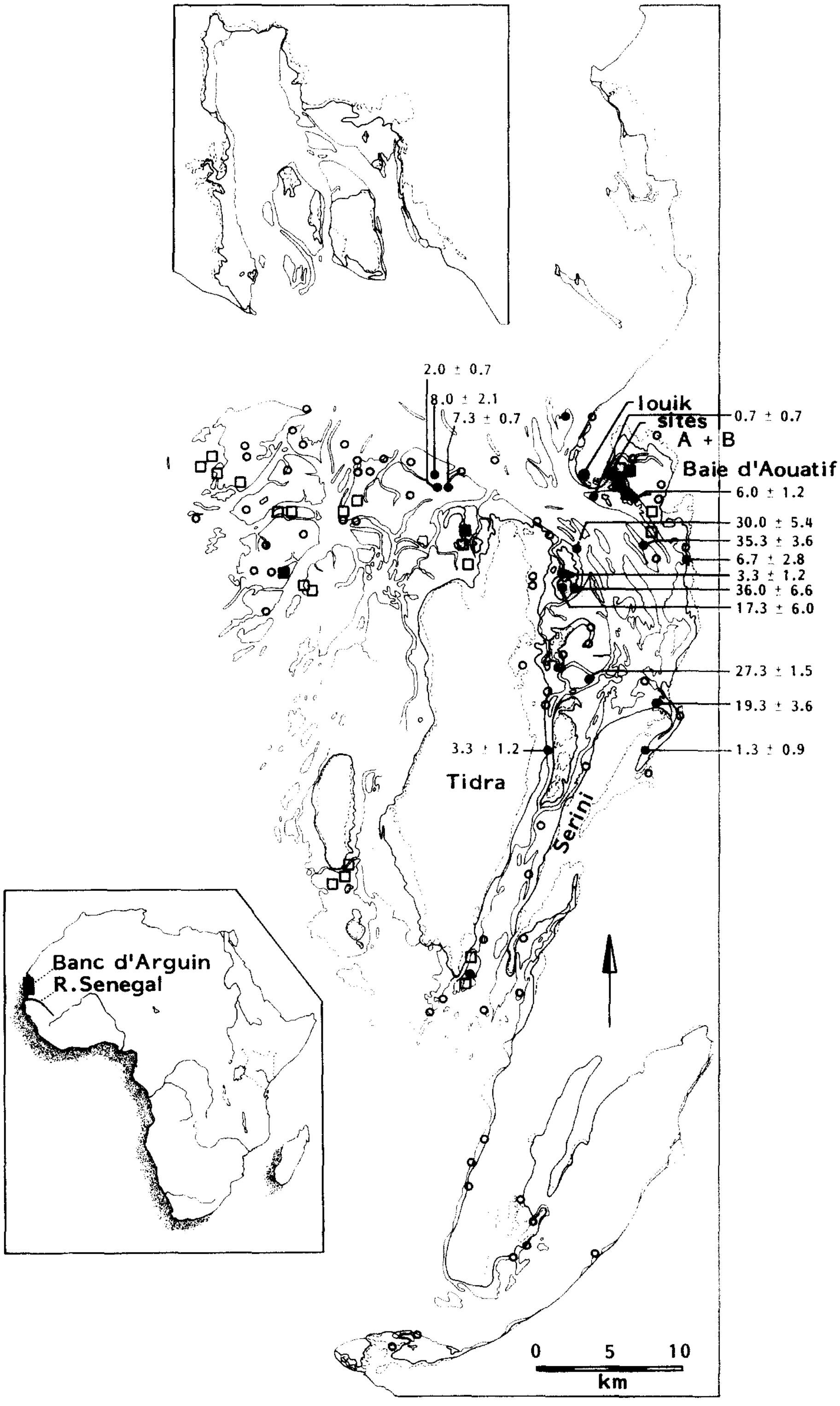

Fig. 1. Map of the tidal flats of the Banc d'Arguin between Iouik and Cap Timiris, Mauritania with the distribution and density (number per m^2 ± 1 s.d.) of *Anadara senilis* in early 1980 and 1986. Open symbols = no. *A. senilis* found; closed symbols = *A. senilis* present; squares = data 1980 (ALTENBURG *et al.*, 1982); circles = data 1986 (this study). The big circle indicates our sites A and B.

nithological Union, the Commission of the European Communities, the Fund for Research for Nature Conservation (FONA), the Netherlands' Ministry of Agriculture and Fisheries, the National Geographic Society, the Society for the Preservation of Nature Monuments in the Netherlands ("Natuurmonumenten"), the Prince Bernhard Foundation, the Shell Internationale Research Maatschappij, and the Netherlands' State Forestry Service ("Staatsbosbeheer").

2. METHODS

All data were collected from 12 to 24 April 1985 and between 6 February and 24 April 1986.

In 1986, data on distribution and biomass were collected by sampling 82 localities scattered over the Banc d'Arguin according to a system of random numbers (WOLFF, 1987). At each locality 6 samples of 0.25 m^2 each were taken according to the "ranked sets method" (MCINTYRE, 1952). Each sample was taken by putting a 0.25 m^2 square on the sediment and collecting by hand all *A. senilis* found. Of each specimen shell height, length and thickness (of both valves together) were measured in mm (Fig. 2). By means of a regression of ash-free dry weight of soft parts on shell dimensions obtained on a tidal flat in the Baie d'Aouatif these data were converted into biomass values.

Condition was defined as ash-free dry weight (AFDW in g) divided by the product of shell length, shell width, and shell thickness (in cm^3). Since the slope of the log-log regression of AFDW on the product of shell dimensions is 0.98 $\pm$ s.e. 0.03 ($n = 244$) this definition is justified.

Data on growth and productivity were collected in two sampling areas near Iouik visited repeatedly. One area (A) was only studied in 1986; it was situated near low tide level at the sandy beach of the Baie d'Aouatif. It was sampled by excavating 25 quadrats of 0.25 m^2 each and sieving the sediment through a 1 mm sieve. This area mainly produced small (<2 cm) specimens. These samples were preserved in 5% formalin and sorted in the laboratory in the Netherlands. Then the flesh was removed from the shells and AFDW determined as described below. No corrections were made for weight loss due to the formalin. The other locality (B) was studied in both years; it was a sandy tidal flat in the Baie d'Aouatif opposite site A (Fig. 1). In 1985 it was sampled with a 0.2 m^2 square, in 1986 with a 0.25 m^2 square. All *A. senilis* were collected by hand. Site B yielded nearly exclusively large (>4 cm) specimens. The positions of the samples at both sites were determined by means of randomly chosen coordinates. At site A shell height, length and thickness as well as AFDW were determined for all individuals, but because of the

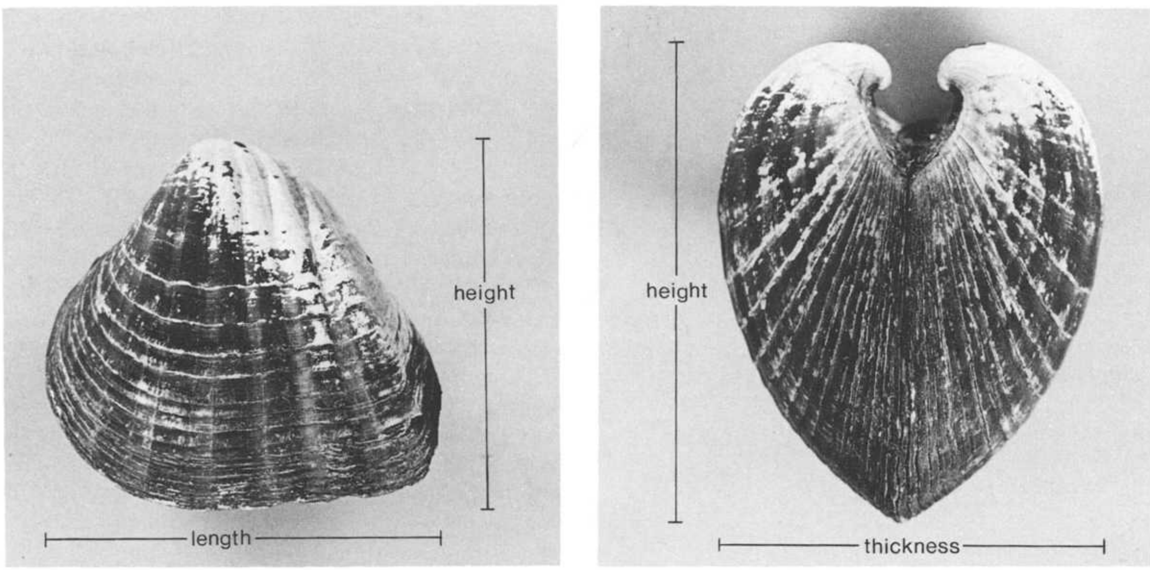

Fig. 2. Shell dimensions of *Anadara senilis* used for calculation of biomass and productivity. The annual growth marks are clearly visible. Photographs: R.F. van Beek, Research Institute for Nature Management.

large number of specimens at site B, AFDW of the specimens from that site was determined only for the first individual encountered in each sample. AFDW was determined as follows: Live animals were submerged in boiling seawater and as soon as the shell opened the fleshy parts were collected. These were dried at about 60°C for 72 hours and finally vacuum sealed in polythene bags. After transport to the Netherlands the samples were dried again at 60°C, whereafter AFDW was determined (accuracy 0.1 g) by incinerating the samples at 560°C for 2 hours. Correlations were calculated between shell dimensions on the one hand and AFDW on the other. The best correlation occurred in most cases between shell height and AFDW (see 3.1), so the equation obtained for this relation was used to convert shell dimensions measured in samples from other sites into AFDW and biomass values.

TABLE 1

Relationship between AFDW (w, in g) and shell dimensions (d, in mm) according to $w = a{\cdot}d^b$ for large (>4 cm) *Anadara senilis* collected at site B in early 1985 and 1986. r denotes the correlation coefficient.

	a	*b*	*n*	*r*
12 April 1985				
shell height	0.0000882	2.521	77	0.75
shell length	0.0002305	2.270	77	0.74
shell thickness	0.0049581	1.646	77	0.59
25 April 1985				
shell height	0.0000664	2.609	40	0.88
shell length	0.0000408	2.663	40	0.89
shell thickness	0.0001885	2.498	40	0.82
17 February 1986				
shell height	0.0000212	2.821	26	0.95
shell length	0.0000068	3.040	26	0.96
shell thickness	0.0000182	3.022	26	0.94
11 March 1986				
shell height	0.0000027	3.304	25	0.84
shell length	0.0000349	2.673	25	0.77
shell thickness	0.0077561	1.494	25	0.45
25 March 1986				
shell height	0.0000023	3.367	24	0.68
shell length	0.0004721	2.092	24	0.58
shell thickness	0.0088979	1.497	24	0.57
12 April 1986				
shell height	0.0000163	2.929	27	0.76
shell length	0.0000278	2.777	27	0.71
shell thickness	0.0002253	2.433	27	0.64

Another series of *A. senilis* at site B was measured in the field, marked and put back in the sediment. This permitted subsequent measurements of living animals.

We were not able to distinguish growth marks while in Mauritania, but careful analyses of the shells in the laboratory enabled independent observers to distinguish equal or nearly equal numbers of growth marks on the same shell (Fig. 2). We have no definitive proof that these growth marks are deposited annually but strongly believe this to be the case (see Discussion). These growth marks seem to correspond with the summer season (see Discussion).

The data obtained at sites A and B resulted in average values for weight and density on four successive dates in 1986. These data have been used to calculate productivity according to CRISP (1984).

3. RESULTS

3.1. RELATIONSHIP BETWEEN SHELL DIMENSIONS AND AFDW

Table 1 gives the relationship between AFDW and either shell height, length or thickness for large *A. senilis* from site B according to the formula

$$w = a{\cdot}d^b$$

in which w = AFDW, d = shell dimension and a and b are constants. In general, shell height gave the highest values for the correlation coefficient r, so all further calculations have been based on the relation between shell height and AFDW (Fig. 3).

An analysis of covariance of the AFDW - shell height data for the 4 sampling data showed that the slopes of the lines did not differ significantly, but that their levels did ($P<0.01$). Hence, all further calculations have been based on the regression equation for the date nearest in time.

Table 2 gives the relationship between AFDW and shell height for small (<2 cm) *A. senilis* from site A. Since analysis of covariance did not result in significant differences between the levels of the lines for the various sampling dates and because a significant difference in slope was due to only 2 outlying data points, all data have been combined into one regression equation (Table 2, Fig. 4), which has been used for further calculations.

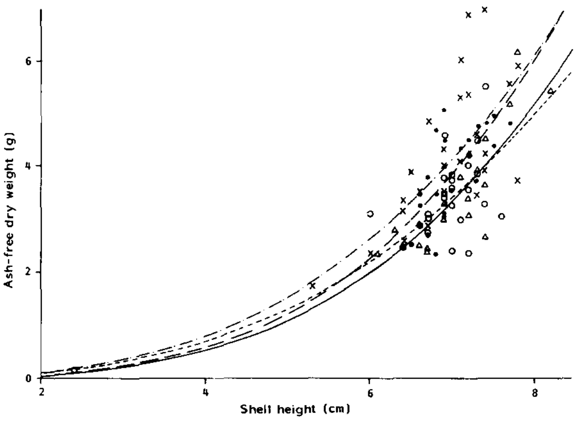

Fig. 3. Relationship between AFDW (g) and shell height (cm) of large *Anadara senilis* at site B in 1986 for 17 February (circles), 11 March (triangles), 25 March (dots) and 12 April (crosses).

3.2. DISTRIBUTION AND BIOMASS

Fig. 1 shows the distribution and mean density of *A. senilis* in 1986. For comparison the data of ALTENBURG *et al.* (1982) obtained in 1980 are shown as well, but as presence or absence because of their small number of samples at each site. *A. senilis* shows a restricted distribution on the tidal flats. It is virtually absent from the more seaward reaches and shows concentrations on the flats NW of Tidra and in the area between Tidra and the mainland N of the tidal divide at Serini.

Biomass distribution is shown in Fig. 5. The average biomass with 95% confidence limits for all localities sampled, but excluding those near or above mean high water level (sebkhas), was 8.1 ± 1.3 g AFDW·m^{-2}. The average biomass for the area between Tidra and the mainland N of the tidal divide near Serini was 18.8 ± 3.3 g·m^{-2}.

TABLE 2

Relationship between ash-free dry weight (w, in g) and shell height (d, in mm) according to $w = a \cdot d^b$ for small (<2 cm) *Anadara senilis* collected at site A in early 1986.

	a	*b*	*n*	*r*
15 February	0.0000214	2.924	79	0.99
12 March	0.0000379	2.620	83	0.99
26 March	0.0000666	2.428	108	0.99
10 April	0.0000239	2.836	72	0.99
All data	0.0000350	2.686	342	0.99

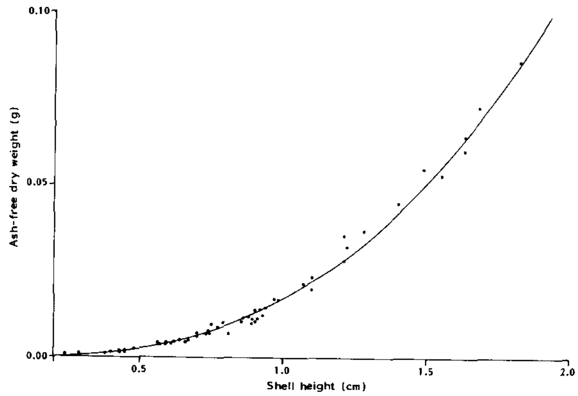

Fig. 4. Relationship between AFDW (g) and shell height (cm) of small *Anadara senilis* at site A in 1986, all data combined.

Fig. 6 shows average shell height per sample in relation to the geographical position of the sample on the gradient from open sea N of Iouik to the tidal divide near Serini. The more landward samples tend to show smaller shell height.

3.3. GROWTH

Only very few specimens of *A. senilis* have such clear growth marks that all consecutive marks can be identified and measured without doubt. For such specimens, Fig. 7 gives a cumulative plot of the distance between consecutive growth marks against the number of each mark (starting with the smallest size). Even with these very clear growth marks we assume that in two out of three specimens we have missed the oldest mark due to erosion of the top of the shell, because juvenile specimens from site A indicate another growth mark at a size of 5 to 10 mm (see Fig. 10).

Because of the shape of the curves in Fig. 7, it is assumed that these growth marks are deposited at equal time intervals, presumably years (see Discussion). Assuming that growth marks are deposited annually, we counted the number of recognizable marks in all specimens collected at site B, after which shell height was plotted against number of growth marks (Fig. 8). In cases of erosion of the top of the shell, we have assumed that an extra growth mark had been present between 5 and 10 mm shell height. The assumption of annual growth marks is supported by the fact that counting of growth marks in the 1985 and 1986 samples resulted in two frequency distributions in which all peaks differ by one year (Fig. 9).

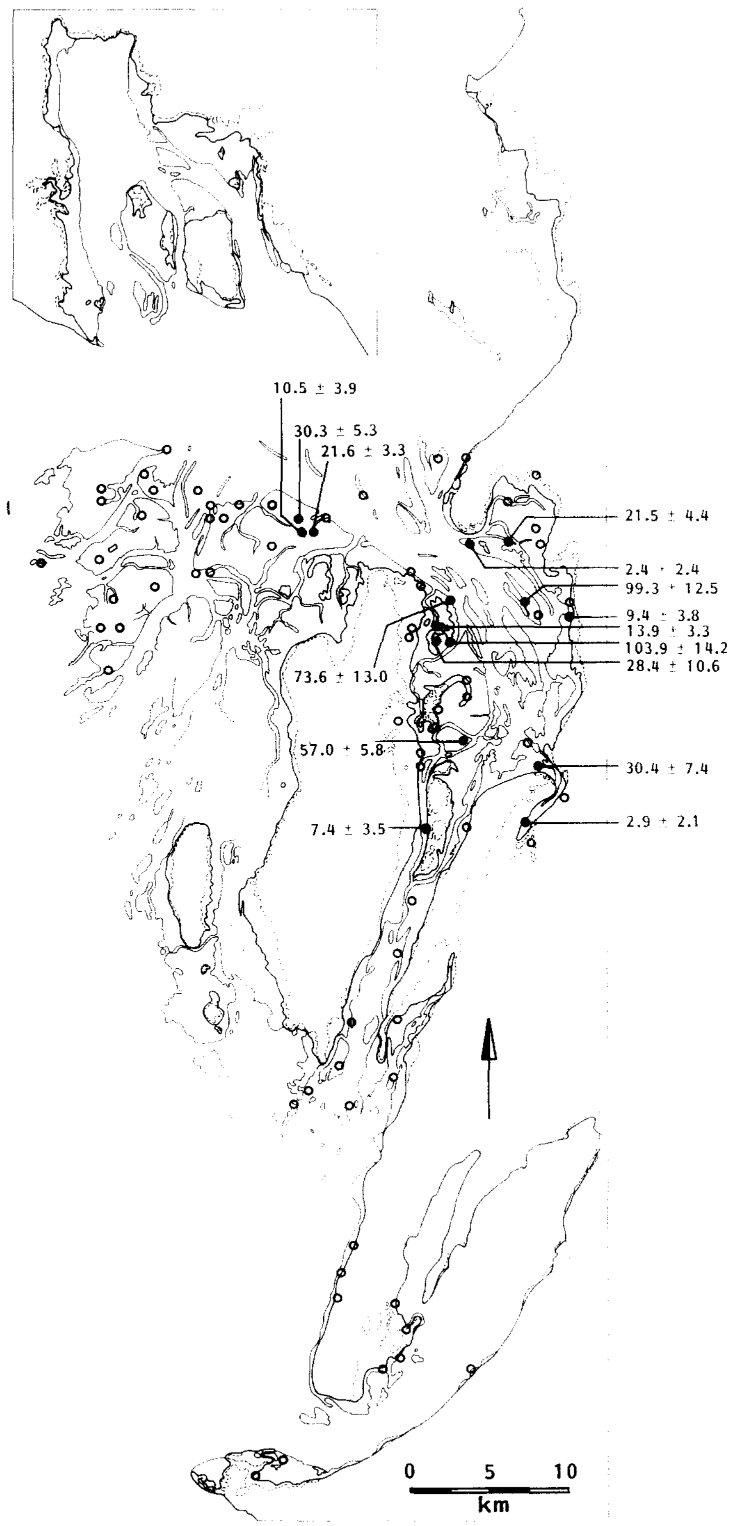

Fig. 5. Distribution of biomass (g AFDW·m^{-2} ± 1 s.d.) of *Anadara senilis* on the tidal flats of the Banc d'Arguin in early 1986. Open symbols = no *A. senilis* found; closed symbols = *A. senilis* present.

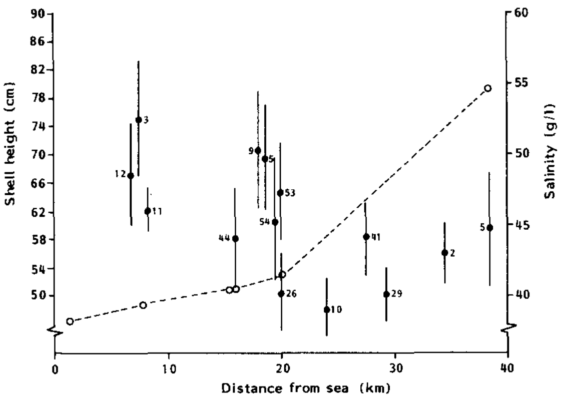

Fig. 6. Relationship between average shell height per sample (± 1 s.d.) and geographical position of the sampling site on the gradient from open sea N of Iouik and the tidal divide near Serini. The open circles denote salinity in April 1986. Numbers denote number of specimens considered.

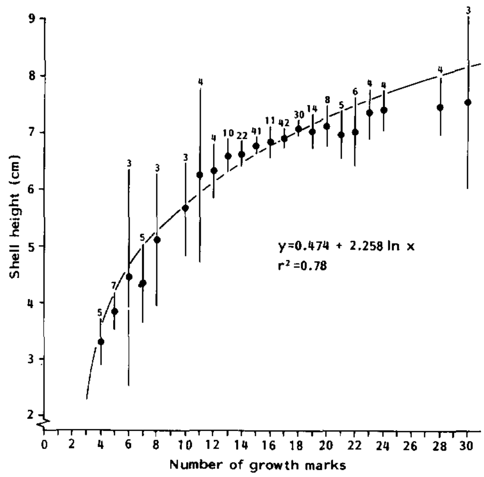

Fig. 8. Height (in cm) of *Anadara senilis* collected at site B in 1985 and 1986 in relation to the number of growth marks. Circles indicate averages, bars indicate 95% confidence intervals for n>3. Numbers denote number of specimens considered. Dots indicate individual data points.

From Figs 8 and 9 it appears that average growth of shell height in animals larger than about 6 cm (*i.e.* older than about 10 years) is 0.5 to 1.0 mm per year. This is in agreement with the results of repeated, careful measurements (0.1 mm units) of the same 46 large individuals of *A. senilis* at site B (Table 3). No significant differences were found for any of the dimensions measured between the four different dates.

Fig. 10 shows the shell height frequency distribution for small *A. senilis* at site A on 4 dates in early 1986. Because of the varying share of very small specimens, comparison of shell dimensions averaged over all year-classes makes no sense. If, however, the modes of the distributions are compared, an increase is noted over time (Table 4), suggesting an average growth of about 2 mm per month. On the other hand, comparison of average shell height of year-class I would result in a growth of about 1 mm per month. We conclude that the rate of shell growth in small specimens is higher than in large ones, but do not want to put a value to it.

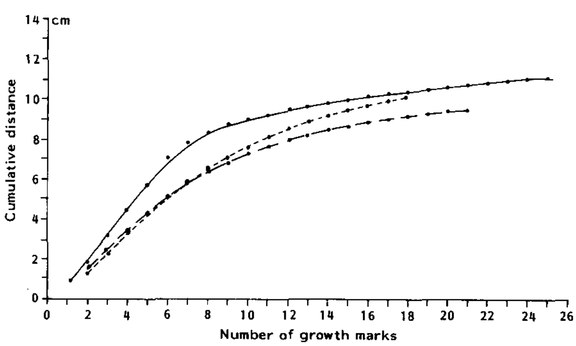

Fig. 7. Cumulative distance ("height") between growth marks (in cm) for 3 specimens of *Anadara senilis* plotted against consecutive growth marks.

3.4. CONDITION

Table 5 shows the condition of the large *A. senilis* collected at site B on different dates in 1985 and 1986. It is concluded that large *A. senilis* showed a somatic growth over the period February - April 1986; a conclusion supported by the 1985 data. This increase of condition is illustrated by the calculated AFDW weights for an average *A. senilis* of 7.0 cm shell height, 7.5 cm shell length and 5.5 cm shell thickness, given in Table 5.

TABLE 3

Average shell dimensions (in mm ± s.d.) of a group of 46 marked individuals of *Anadara senilis* at site B in early 1986.

	height	*length*	*thickness*
11 March	68.27 ± 4.10	72.21 ± 5.05	54.88 ± 4.06
25 March	67.73 ± 4.03	72.03 ± 4.94	54.57 ± 4.28
27 March	68.13 ± 3.98	71.87 ± 4.99	54.91 ± 4.03
15 April	67.36 ± 3.93	71.59 ± 5.06	55.03 ± 4.08

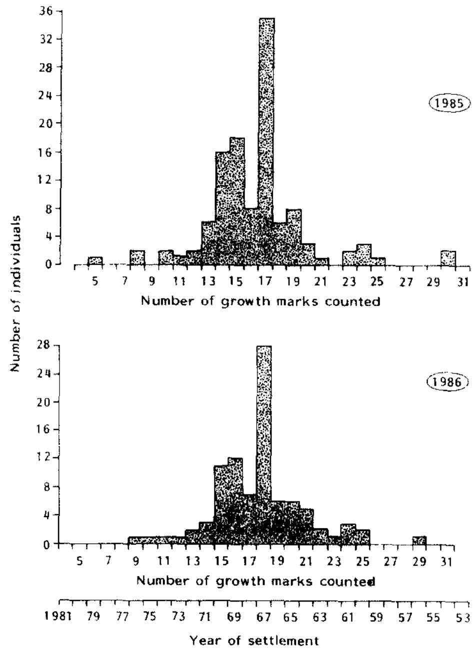

Fig. 9. Frequency of occurrence of growth marks of *Anadara senilis* at site B in April 1985 and February to April 1986. The axis at the bottom shows the year of settlement. This year has been obtained by assuming that settlement occurs in autumn and that our counts did not include the first growth marks.

3.5. MORTALITY

At site A no data could be collected on mortality of small *A. senilis*. However, it may be assumed to be high since we found no specimens larger than 20 mm shell height. Also elsewhere on the Banc d'Arguin specimens between 20 and 40 mm shell height were rare.

Table 6 gives densities of *A. senilis* at site B in 1980 (data from ALTENBURG *et al.*, 1982), 1985 and 1986. Comparison of the 1980 and 1985 values with the average value (27.24) of the 4 observations in 1986 points to an annual mortality of about 10%, provided that no recruitment took place (compare Fig. 9). The 1986 figures, however, seem to show a mortality of 25% in two months, which is highly unlikely for a large and long-living species. The difference observed between our samplings, which is barely significant at the 5% level, may therefore have been caused by sampling errors due to the aggregated distribution of the species. On the other hand, comparing the numbers of *A. senilis* 10 to 19 years old with those 20 to 29 years old (Fig. 9) under the assumption that, on average, settlement was comparable in both periods, one arrives again at an annual mortality in the order of magnitude of 10% or about 2% in the period of our 1986 observations.

TABLE 4

Shell height (in mm) of (<2 cm) small *Anadara senilis* at site A in early 1986.

	average of all year-classes	*average of year class I*	*mode of all year-classes*	*n*
15 February	7.1	?	5.5	79
12 March	6.8	8.0	7.5	83
26 March	6.5	8.4	7.5	108
10 April	8.1	9.1	9.5	72

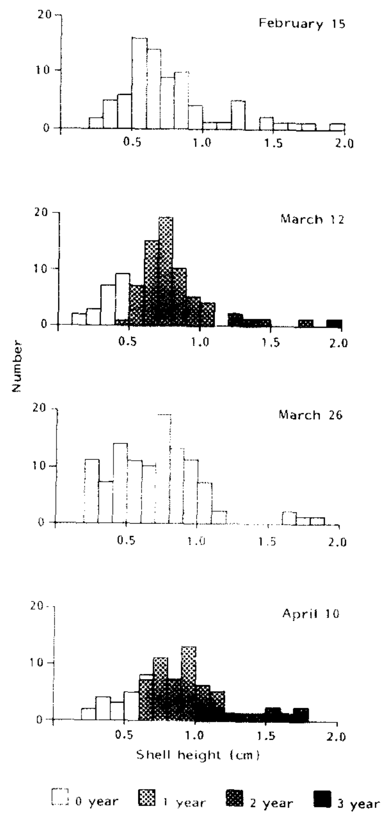

Fig. 10. Frequency distributions of shell height of *Anadara senilis* at site A on 4 dates in early 1986. For March 12 and April 10 the numbers in each year-class are shown as well. The shells of the animals collected on other dates had been incinerated to determine carbonate production, thus inhibiting age determinations.

TABLE 5

Condition indices ($g \cdot cm^{-3}$) for large (>4 cm) *Anadara senilis* collected at site B in early 1985 and 1986. If the 95% confidence intervals overlap, averages are not significantly different at the 5% level (Student's t-test). The last column shows the calculated AFDW (g) for an individual of 7.0 cm shell height, 7.5 cm shell length and 5.5 cm shell thickness.

Date	*Condition index*	*n*	*95% conf. interv.*	*AFDW*
12 April 1985	0.01432	77	0.01374 - 0.01490	4.135
24 April 1985	0.01488	40	0.01403 - 0.01572	4.297
17 February 1986	0.01143	26	0.01015 - 0.01271	3.300
11 March 1986	0.01136	25	0.01061 - 0.01210	3.280
25 March 1986	0.01244	24	0.01108 - 0.01380	3.592
12 April 1986	0.01470	27	0.01340 - 0.01599	4.245

4. DISCUSSION

The assumption that growth marks on the shells of *A. senilis* are deposited annually is essential to all our conclusions. So what evidence do we have that these marks are formed annually?

In the first place, conditions on the Banc d'Arguin show some seasonality. BRULHET (1974, in ALTENBURG *et al.* 1982), gives monthly averages for water temperatures near Nouadhibou. Winter values are about 17°C, whereas summer values go up to 22°C at an inshore station in September. However, in the tidal channel between our sites A and B we measured 21 to 22°C already in April. Hence, we speculate that near our sites, water temperatures will reach at least 30°C towards the end of summer. Also salinity might become very high, since we measured S = 40 near our sites already in April. This combination of high temperature and high salinity in summer may be the factor responsible for temporary growth reduction and hence the production of a growth mark (KINNE, 1970), although other factors, such as changes in food quantity, cannot be excluded. The detrimental effect of the combination of high temperature and of salinity was shown by YANKSON (1982), who found that *A. senilis* could not withstand 32-34°C in combination with a salinity over 50. This hypothesis is reinforced by the fact that on our animals collected in February - April 1986 the latest band of shell growth was as large as or even larger than the one before.

Secondly, the one-year shift in the frequency distribution of growth marks between 1985 and 1986 (Fig. 9) forms a strong argument.

Thirdly, the relation between the number of growth marks and shell height shows close resemblance (Fig. 7), *viz.* reasonable resemblance (Fig. 8), to normal growth curves for invertebrates.

For these reasons it is concluded that growth marks develop at regular time intervals. Since our field observations (*e.g.* Table 3) show that the diurnal tidal and the spring-neap tidal cycles cannot be involved, the most likely interval becomes the yearly one.

Fourthly, the slow growth rate inferred from the growth marks is in agreement with our failure to measure growth rates directly (Chapter 3.3).

On the supposition that growth marks are annual, Fig. 9 shows that animals of 15, 16 and 18 years of age in 1986 were more numerous than animals of other ages. The dominance of these

TABLE 6

Average density (number per $m^2 \pm 1$ s.d.) of *Anadara senilis* at site B in 1980 (data from ALTENBURG *et al.*, 1982), 1985, and 1986; n = number of samples. The significance of the differences is indicated as well.

	density	*n*	*12-4-85*	*17-2-86*	*11-3-86*	*25-3-86*
February 1980	56.00	1				
12 April 1985	30.50 ± 4.25	10	--			
17 February 1986	30.72 ± 2.66	25	N.S.	--		
11 March 1986	31.04 ± 2.94	25	N.S.	N.S.	--	
25 March 1986	23.20 ± 2.63	25	N.S.	0.025	0.03	--
12 April 1986	24.00 ± 2.97	25	N.S.	0.05	0.05	N.S.

three age groups might even be stronger, since in many individuals our count may not have been accurate due to poor distinction of especially the oldest growth marks. This implies that the winters 1970 - 71, 1969 - 70 and 1967 - 68 will have been favourable for settlement. Since YOLOYE (1976) characterizes *A. senilis* as a brackish water species (see also DJANGMAH *et al.*, 1979), we put forward the hypothesis that settlement of *A. senilis* is enhanced by brackish conditions. On the Banc d'Arguin such conditions can occur only after heavy rainfall. Since rainfall data from the Banc d'Arguin do not exist, we have assumed that rainfall in this area is correlated with rainfall in the western part of the Sahel in general, and hence with the discharge of the river Senegal. Indeed, we were able to demonstrate a significant correlation between year-class strength (compensated for an annual mortality of 10%) and average monthly discharge of the river Senegal at Baker (Spearman rank correlation; $r = 0.62$; $P < 0.01$) (Fig. 11).

However, we did not collect sufficient shell material from other sites to check whether the relation between year-class strength and river discharge also holds for other parts of the Banc d'Arguin. Evidence supporting our hypothesis is the restricted distribution of *A. senilis* on the Banc d'Arguin, occurring mainly in land-locked bays where heavy rainfall will be able to lower salinity.

The relationship between shell height and

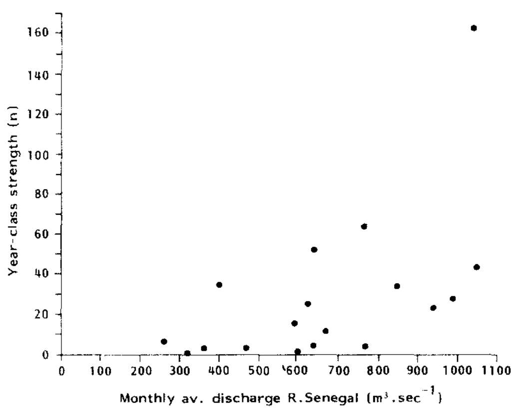

Fig. 11. Relationship between average monthly discharge of the river Senegal at Baker per year and the year-class strength of *Anadara senilis* on the Banc d'Arguin. Data on river discharge from ORSTOM through Mr. J.J. den Held. The year-class strength has been obtained by adding the 1985 and 1986 data as shown in Fig. 9 and correcting these figures for an annual mortality of 10%.

location of the sampling site (Fig. 6) is possibly caused by the detrimental effect of the gradient of increasing salinity in a landward direction. Since we did not collect the specimens on which this relationship is based, we have been unable to check the age distribution of these samples.

In the part of the tidal flats we sampled we found an average biomass of 8.1 g AFDW·m^{-2}. This is about 75% higher than the value (4.7 g·m^{-2}) found by ALTENBURG *et al.* (1982). The difference can be explained at least partly by the fact that a smaller percentage of our samples originates from the western part of the tidal flats where *A. senilis* is nearly absent (Fig. 1). Since the tidal flats we did not sample comprise about 30% of the total area of flats (Fig. 1) and since *A. senilis* is nearly absent from these flats (Figs 1 and 5), the average biomass of *A. senilis* for the entire area may be estimated at about 5.5 g AFDW·m^{-2}.

From the relationship between age and shell height (Fig. 8) and that between shell height and AFDW (Fig. 3), an estimate of production can be made. The annual weight increment of a 17-year-old individual can be computed to be 0.075 g AFDW. With an initial density of 30 specimens per m^2 (Table 6) and an annual mortality of 10% (chapter 3.5), this results in an estimated somatic population production of 2.280 g AFDW·m^{-2}, if seasonal weight changes (see Table 5) are disregarded. This results in a P/B ratio of about 0.02 for the population at site B in 1985-86. It should be realized that the same population shortly after settlement of the strong age-classes will have had a much higher P/B ratio and production.

Predation on *A. senilis* on the Banc d'Arguin has seldom been observed. We have no direct observations on predation of small *A. senilis* at site A, but assume that they may be taken by birds (*e.g.* the Oystercatcher - *Haematopus ostralegus* and Bar-tailed godwit - *Limosa lapponica*) and fish (*e.g.* the Guitar ray - *Rhinobatos rhinobatos*).

Predators on large *A. senilis* are rare. Oystercatchers are the only bird species able to open an individual more than 5 years old (ALTENBURG *et al.*, 1982; SWENNEN & DUIVEN, in prep.). With a feeding rate of about 2 *A. senilis* per hour and about 7 hours of feeding time per tide and less than 10,000 Oystercatchers wintering on the Banc d'Arguin (ALTENBURG *et al.*, 1982), these birds could take ~ 5 to 10% of the population per year.

The gastropod *Cymbium cymbium* is another predator (ALTENBURG *et al.*, 1982; our own observations). Due to its low density (a few specimens per 10,000 m^2) and its presumably low feeding rate (1 *A. senilis* per high tide?), its impact on the population of *A. senilis* would be less than 1% per year.

Finally we observed crushed specimens of large *A. senilis* near the edges of some tidal channels at low tide. We suspect that this reflects predation by a large fish, but have no clue to its identity. YOLOYE (1976) records the ray *Trygon margarita* as a predator on spat.

From the previous paragraphs the following picture of the life-history of *A. senilis* on the Banc d'Arguin arises: the species may be reproducing every year, but in most years much of the spat will disappear before a large size is reached. Only occasionally will a massive spatfall result in a year-class dominating the population. This initially results in a very productive population of small animals, gradually changing into a population of predominantly old and large-sized animals with a high biomass, but a relatively low production. Predation on this latter population is restricted to a few specialized predators and part of the population disappears due to other factors, the nature of which one can only speculate on. This picture of the life-history of *A. senilis* is very similar to that sketched by BEUKEMA (1976) for the bivalve *Mya arenaria* in the Dutch Wadden Sea.

5. RÉSUMÉ

Au début de 1985 et 1986, les données sur la distribution, l'écologie, la biomasse, le recrutement, la croissance, la mortalité et la productivité d'*Anadara senilis* ont été compilées sur le Banc d'Arguin en Mauritanie.

Poids sec sans cendres se trouvait être corrélé le mieux avec le hauteur de coquille. *A. senilis* était abondant aux vasières tout près de la côte. La biomasse moyenne pour toute la région de vasières était estimé à 5,5 g de poids sec sans cendres par mètre carré. La population d'*A. senilis* se composait surtout d'individus âgés de 10 à 20 ans, avec une croissance très lente et un rapport de production/biomasse d'environ 0,02. Les huîtriers pie, le gastropode *Cymbium cymbium* et quelques espèces de poisson inconnues sont en large mesure responsables de la mortalité qui s'élève à 10% par an approximativement. La survie des animaux nouveau-nés était négligeable. En distinguant des marques de croissance annuelle, on pouvait établir l'effectif de classes annuelles qui se trouvait en corrélation avec l'écoulement moyen du fleuve Sénégal. Ceci s'explique en supposant que l'effectif de classes annuelles de même que l'écoulement du fleuve sont en rapport avec la précipitation sur le Banc d'Arguin.

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